NUI Galway
OÉ Gaillimh

Semester I Examinations 2012/ 2013

Exam Code(s)	4IF1
Exam(s)	B.Sc. in Information Technology
Module Code(s)	CT417
Module(s)	Software Engineering III
Paper No.	1
Repeat Paper	
External Examiner(s)	Prof. Michael O'Boyle
Internal Examiner(s)	Prof. G. Lyons Dr. Jim Duggan Dr. Owen Molloy * Dr. David O'Sullivan *
Instructions:	Candidates should attempt four questions, two questions from each section. All questions carry equal marks ***Use separate answer books for each Section***.
Duration	3 hours
No. of Pages	4

Requirements:
MCQ
Handout
Statistical/ Log Tables
Cambridge Tables
Graph Paper
Log Graph Paper
Other Materials

Release to Library: Yes ☐ No ☐

SECTION A

(Project Management – Dr. O'Sullivan)

All sub-questions carry equal marks. Answer questions in the context of innovation within an IT organisation and use IT projects and ideas as examples throughout your answers.

1.

a) Define *innovation* with particular reference to the branch of software development that you are interested in.
b) Explain how project management is an integral element in innovation management.
c) Give five examples of innovative products, concepts or developments in the software industry
d) Name one SaaS product that you have reviewed for lean project management and explain its 'value propositions' for end users such as yourself.

[25]

2.

a) Outline the process of defining goals for an IT organization.
b) Explain the difference between *thrusts* or *clusters* and strategic objectives
c) How do strategic objectives differ from projects
d) Design a form using 'minimum critical specification' for the codification of an innovation goal and populate with a sample goal.

[25]

3.

a) What are the four key overlapping strategies used in project portfolio management? Name one tool used for each strategy.
b) In a bubble diagram of risk versus reward what are each of the four quadrants commonly called?
c) Explain the 'portfolio dominates' approach to balancing a portfolio of projects.
d) Design a simple Excel based tool for mapping relationships between projects and strategic objectives and drawn from your experience in developing your own class assignments.

[25]

4.

a) Outline the key stages of a project lifecycle with reference to the stage-gate process.
b) Write out and explain the simple equation for 'payback' of an investment project.
c) What other techniques can be used for ranking and selecting projects?
d) Design a simple form for gathering critical information relating to an IT project e.g. project title and capital cost. Illustrate how 'project risk' might be incorporated into the form.

[25]

SECTION B

(Software Quality – Dr. Molloy)

5. (a) Different stakeholders in a project have different perspectives on software quality. Describe three main stakeholders in the development of an online shopping system, and using a quality model (e.g. McCall's quality factors), define the different stakeholders quality requirements for the system.

[15]

(b) For the project described in (a) above, give 3 examples of internal (development) quality metrics and explain how would you go about measuring them?

[10]

6. You have been asked to initiate a project to reduce the amount of rework caused by defects in the requirements, design and coding activities. Assuming you have decided to use the DMAIC approach, describe:

i. the main phases of the project
ii. the activities you would envisage as part of the project
iii. the tools you would use in each phase of the project

[25]

7. (a) Explain the principles of *Lean thinking* and how they can be applied to software development.

[7]

(b) You are thinking of revamping the NUIG Blackboard website and decide to get feedback from a representative group of student users. Describe the Kano analysis method and explain the procedure you would use to apply it.

[10]

(c) Explain the meaning of the following terms pertaining to the Scrum agile process:

- Sprint
- Product Backlog
- Daily Scrum
- Sprint Burndown

[8]

8. (a) You have noticed that there is a large degree of variability in the coding productivity achieved by different members of a development team. Explain what the causes of this variability might be.

[7]

(b) Describe (using examples) how the following tools could be used in your analysis of the problem described in part (a) of this question:

- Fishbone Diagram
- Pareto Chart
- Histogram
- Scatter Chart
- Control Chart

[18]